

App. No.: 09/683822
Filed: February 20, 2002
Conf. No.: 7485

**APPENDIX
CLEAN COPY OF CLAIMS ON APPEAL**

1. An electrically operated starter for an internal combustion engine, said starter comprising a DC electrical motor having an output shaft in starting arrangement with a shaft of the engine for starting the engine upon the application of electrical power, said motor being comprised of cooperating, relatively rotatable permanent magnet and selectively energized coil winding elements, said permanent magnet element being comprised of circumferentially spaced permanent magnets of opposite polarity, said coil winding element being comprised of circumferentially spaced magnetic pole cores around which electrical coils are wound, said cores having ends in facing relation to said permanent magnets, said motor having reduced vibration after the discontinuation of application of electrical power to said coil winding elements upon engine starting by at least one of reducing the cogging torque of the starter motor and rigidifying the outer housing of the starter motor.
2. A starter for an internal combustion engine as set forth in claim 1, wherein the motor vibrations after engine starting are reduced by reducing the cogging torque of the starter motor.
3. A starter for an internal combustion engine as set forth in claim 2, wherein the relationship between the pole cores facing ends and the permanent magnets is skewed to reduce the cogging torque of the starter motor.
4. A starter for an internal combustion engine as set forth in claim 3, wherein the permanent magnets are skewed relative to the axis of relative rotation and the pole cores are not.
6. A starter for an internal combustion engine as set forth in claim 4, wherein the edges of the permanent magnets are skewed but their magnetization is in the direction of the axis of relative rotation.
9. A starter for an internal combustion engine as set forth in claim 4, wherein each of the permanent magnets is comprised of axially spaced and circumferentially spaced but circumferentially overlapping segments.
11. A starter for an internal combustion engine as set forth in claim 9, wherein each permanent magnet is comprised of an uneven number of segments consisting of a center segment and side segments circumferentially spaced from said center segment but circumferentially overlapping said center segment.
12. A starter for an internal combustion engine as set forth in claim 11, wherein there are more than one side segment on each side of the center segment and the side segments on each side are circumferentially spaced from each other.

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23. A rotating electrical machine of reduced cogging torque at the time after said machine is powered comprised of cooperating, relatively rotatable permanent magnet and coil winding elements, said permanent magnet element being comprised of circumferentially spaced permanent magnets of opposite polarity, said coil winding element being comprised of circumferentially spaced magnetic pole cores around which electrical coils are wound, said cores having ends in facing relation to said permanent magnets, the relationship between said pole cores facing ends and said permanent magnets being skewed to reduce the cogging torque of the starter motor at the time after said machine has been powered and power is no longer being applied, each of said permanent magnets being comprised of axially spaced and circumferentially spaced but circumferentially overlapping segments to effect the skewing.

25. A starter for an internal combustion engine as set forth in claim 23, wherein each permanent magnet is comprised of an uneven number of segments consisting of a center segment and side segments circumferentially spaced from said center segment but circumferentially overlapping said center segment.

26. A starter for an internal combustion engine as set forth in claim 25, wherein there are more than one side segment on each side of the center segment and the side segments on each side are circumferentially spaced from each other.